AUDIO POLE

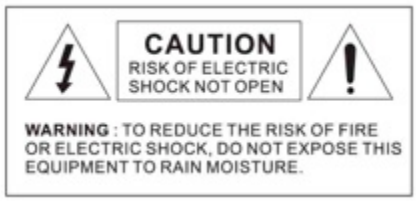
Speaker Management Processor

DSP 24

USER'S MANUAL

Safety Instructions

READ CAREFULLY THE FOLLOWING INSTRUCTIONS


CAUTION
RISK OF ELECTRIC SHOCK NOT OPEN
WARNING : TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN MOISTURE.

This symbol indicates the presence of a dangerous voltage.

This made symbol refers to information in the instructions manual.

POWER SUPPLY
Connect the appliance only on a current corresponding to the characteristics listed in the back of the device. Failure to observe this precaution could result in fire or electric shock, or a failure not covered by the warranty.

POWER CORD
Before using the appliance for the first time, check that the supply voltage is consistent with that of the sector. Before connection to the mains check that the power cord is properly plugged. Route the power cord so that it cannot be squashed or bent and keep it away from moisture and significant heat sources. In case of deterioration or failure please contact dealer to replace it with an identical cord. A damaged cord may result in fire or electric shock.

PROTECTIVE GROUND
The appliance must be connected to the ground, don't remove the ground wiring of the power cord connector.

HUMIDITY
Do not expose the unit to rain or moisture and do not place container containing a liquid that might tip over. Do not handle any connector with wet hands. In case of thunderstorm, turn the unit off and disconnect it from any power outlet.

HEAT
Do not install the unit in a place subject to excessive heat or direct radiation from the Sun. Operating ambient temperature must not be below 5 ° C (41 ° F) or above 35 ° C (95 ° F).

DAMAGE
Unplug immediately in the event of introduction of liquids or objects in the device as well as in the event of damage to the power cable. Also unplug the unit if it emits smoke, an odor, or unusual noise. Then contact a dealer or a Service Center authorized by Audiopole.

DISPOSAL

This symbol indicates that the disposal of this product is submitted to local regulations. Please contact your local dealer.

INDEX

I- OPERATING MENU . . . . . page 1

A- MODE SELECTION . . . . . page 1

B- PARAMETERS EDITING . . . . . page 1
1- INPUTS . . . . . page 1
Gain . . . . . page 1
Delay . . . . . page 2
EQ . . . . . page 2
2- OUTPUTS . . . . . page 2
Name . . . . . page 2
Source . . . . . page 3
Gain . . . . . page 3
Limiter . . . . . page 3
Delay . . . . . page 3
Polarity . . . . . page 3
Hi-pass Filter . . . . . page 4
Low-pass Filter . . . . . page 4
EQ . . . . . page 4
VU Meter . . . . . page 4

C- PRESETS MANAGEMENT. . . . . page 5
1- Presets save . . . . . page 5
2- Presets recall . . . . . page 6
3- Presets delete . . . . . page 6

D- LOCK . . . . . page 7
1- Simple lock . . . . . page 7
2- Lock with password . . . . . page 7
3- Display lock . . . . . page 8

II- APPENDIX . . . . . page 9

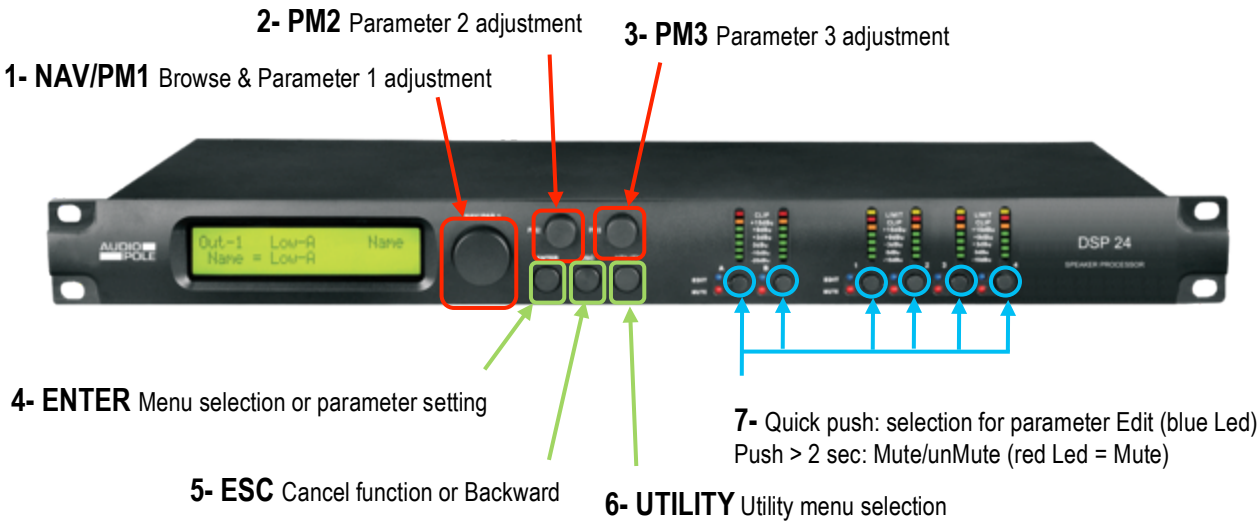
1- Digital input selection . . . . . page 9
2- Power-on status . . . . . page 9
3- Unit for the delay . . . . . page 9
4- Real time modifications . . . . . page 9
5- Firmware version . . . . . page 10
6- User interface selection . . . . . page 10
7- Reset procedure . . . . . page 10

III- TECHNICAL SPECIFICATIONS . . . . . page 10

IV- BACK PANEL . . . . . page 11

V- WARRANTY . . . . . page 11

I- OPERATING MENU


2- PM2 Parameter 2 adjustment
3- PM3 Parameter 3 adjustment
1- NAV/PM1 Browse & Parameter 1 adjustment
DSP 24
4- ENTER Menu selection or parameter setting
7- Quick push: selection for parameter Edit (blue Led)
Push > 2 sec: Mute/unMute (red Led = Mute)
5- ESC Cancel function or Backward
6- UTILITY Utility menu selection

A- MODE SELECTION

The DSP24 has two factory pre-set modes: "**1 x 2 Ways Xover**'' and "**4 Ways Xover**''.

Press **UTILITY** and use **NAV/PM1** button to display:

Press **ENTER** to display:

Use **PM2** to select the menu, and then press **ENTER** two times to confirm.

REMARK:

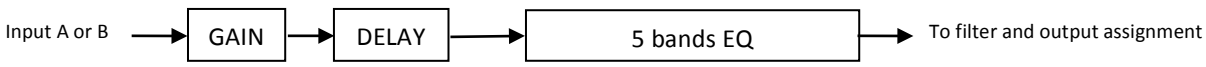
- Mode "**1 x 2 Ways**" assigns the inputs to the outputs like below :
  Input A to Outputs 1 (Low) / 2 (Hi), and Input B to Outputs 3 (Low) / 4 (Hi)
- Mode "**4 Ways**" assigns the Input A to all outputs. Input B is not used.

Routing and filters can be edited afterwards (see paragraph B - 2 below).

B- PARAMETERS EDITING

1- INPUTS:

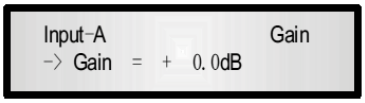
The signal path for every input is as follow:



Press (quick push) the button **7** of the input, the blue Led lights.

NOTE: It is possible to adjust two inputs simultaneously: press the button **7** of one other input. The first one has priority on the others.

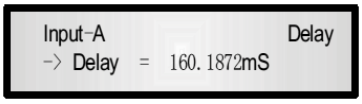
GAIN:



Press **ENTER** then adjust the value with **PM2**
It varies from -12dB to +6dB by 0.1dB steps.

NEXT PARAMETER: **A- without** gain modification: press **NAV/PM1**
B- after a gain modification: press **ESC** then press **NAV/PM1**

DELAY :



Press **ENTER** then adjust the values with **PM2** and **PM3**
It varies from 0m to 288.659m (848ms) by 7cm steps (0,02ms).

NEXT PARAMETER: **A- without** delay modification: press **NAV/PM1**
B- after a delay modification: press **ESC** then press **NAV/PM1**

The DSP 24 features 5 bands EQ on every input, named EQ-1 to EQ-5

EQ-1:

Press **ENTER** then adjust the parameters: **(idem EQ-5)**

- Variable frequency from 20Hz to 20,000Hz with **NAV/PM1**
- Variable bandwidth with Low Shelve -6 or -12dB, or 0.05 and 3.0 Octave with **PM2**
- Variable level between -15 and -15dB with **PM3**

MOVE TO EQ-2: **A- without** EQ-1 modification: press **NAV/PM1**
B- after EQ-1 modification: press **ESC** then press **NAV/PM1**

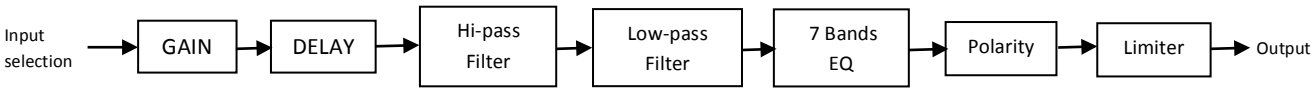
EQ-2 : Press **ENTER** then adjust the parameters: **(idem EQ-3 & 4)**

- Variable frequency from 20Hz to 20,000Hz with **NAV/PM1**
- Variable bandwidth between 0.05 and 3.0 Octave with **PM2**
- Variable level between -15 and -15dB with **PM3**

Same procedure for each band.

2- OUTPUTS:

The signal path for outputs is as follow:



Press (quick push) the button **7** of the selected output, the blue Led lights.

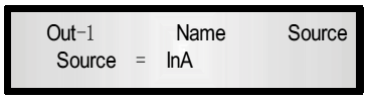
NOTE: It is possible to adjust several outputs simultaneously: in this case press the button **7** of one other outputs. The first one has priority on the others.

OUTPUT NAME:

Press **ENTER**, the first letter blinks. Use **PM2** to select the letter
Press **ENTER** to go to the next letter. Use **PM2** to select the letter
Repeat to write the full name

GO TO THE NEXT PARAMETER: **A- without** having changed the name: press **NAV/PM1**
B- after the name change: press **ESC** and press **NAV/PM1**

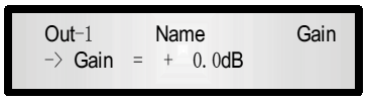
SOURCE :



Press **ENTER** then adjust with **PM2**
The source can be input A, input B or both inputs summation.

GO TO THE NEXT PARAMETER: **A- without** having changed the source: press **NAV/PM1**
B- after the source change: press **ESC** and press **NAV/PM1**

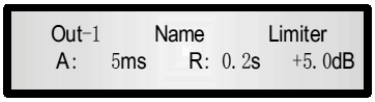
GAIN:



Press **ENTER** then adjust with **PM2**
It varies from -12dBto +6dB with 0.1dB step

GO TO THE NEXT PARAMETER: **A- without** having changed the gain: press **NAV/PM1**
B- after the gain change: press **ESC** and press **NAV/PM1**

LIMITER:

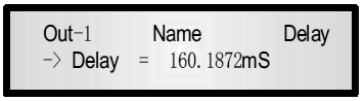


Press **ENTER** then adjust the parameters:

- Attack time from 5 to 200ms with **NAV/PM1**
- Release time from 0.1 to 3s with **PM2**
- Threshold from -10 to +20dB with **PM3**

GO TO THE NEXT PARAMETER: **A- without** having changed the limiter: press **NAV/PM1**
B- after the limiter change: press **ESC** and press **NAV/PM1**

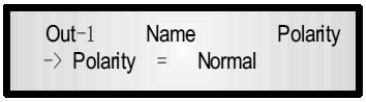
DELAY:



Press **ENTER** then adjust with **PM2** and **PM3**
It varies from 0m to 288.659m (848ms) with 7cm (0.02ms) step

GO TO THE NEXT PARAMETER: **A- without** having changed the delay: press **NAV/PM1**
B- after the delay change: press **ESC** and press **NAV/PM1**

POLARITY:



Press **ENTER** then adjust with **PM2**

GO TO THE NEXT PARAMETER: **A- without** having changed the polarity: press **NAV/PM1**
B- after the polarity change: press **ESC** and press **NAV/PM1**

HI-PASS FILTER (HPF):

Press **ENTER** then adjust the parameters
Cut off frequency from 20Hz to 20kHz with **PM2**
Filter type with **PM3**
Available filters:

- Butterworth 6, 12, 18 or 24dB/Octave
- Bessel 12 or 24dB/Octave
- Linkwitz-Riley 12 or 24dB/Octave

GO TO THE NEXT PARAMETER: **A- without** having changed the HPF: press **NAV/PM1**
B- after the HPF change: press **ESC** and press **NAV/PM1**

LOW-PASS FILTER (LPF)

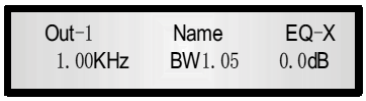
Press **ENTER** then adjust the parameters
Cut off frequency from 20 Hz to 20 kHz with **PM2**
Filter type with **PM3**
Available filters:

- Butterworth 6, 12, 18 or 24dB/Octave
- Bessel 12 or 24dB/Octave
- Linkwitz-Riley 12 or 24dB/Octave

GO TO THE NEXT PARAMETER: **A- without** having changed the LPF: press **NAV/PM1**
B- after the LPF change: press **ESC** and press **NAV/PM1**

The DSP 24 features a 7 band EQ on every output: EQ-1 to EQ-7.

EQ-1:



Press **ENTER** then adjust the parameters: **(idem EQ-5)**

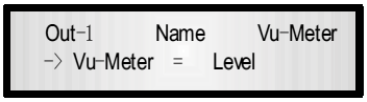
- Variable frequency from 20Hz to 20,000Hz with **NAV/PM1**
- Variable bandwidth between 0.05 and 3.0 Octave with **PM2**
- Variable level between -15 and -15dB with **PM3**

MOVE TO EQ-2: **A- without** EQ-1 modification: press **NAV/PM1**
B- after EQ-1 modification: press **ESC** then press **NAV/PM1**

Same procedure for the others EQ.

MOVE TO OTHER EQ: **A- without** EQ modification: press **NAV/PM1**
B- after EQ modification: press **ESC** then press **NAV/PM1**

VU-METER :



Press **ENTER** then adjust with **PM2**
LEVEL: output level display
LIMITER ACT: Limiter action display

GO TO THE NEXT PARAMETER: **A- without** VU-Meter modification: press **NAV/PM1**
B- after VU-Meter modification: press **ESC** then press **NAV/PM1**

C- PRESETS MANAGEMENT

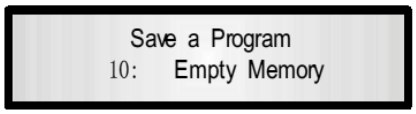
1- PRESETS SAVE:

Press **UTILITY** and use **NAV/PM1** to display:

Press **ENTER** and use **NAV/PM1** to display:

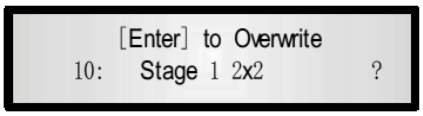
The DSP 24 features 24 user presets

Press **ENTER**: use **PM2** or **PM3**, the display indicates “Empty Memory", for instance :

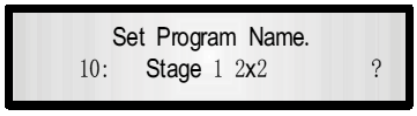


Press **ENTER** to valid the preset number, the display indicates:

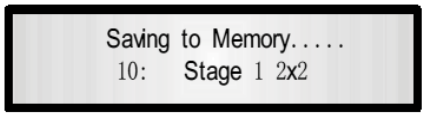
To clear and overwrite an existing preset, press **ENTER**, then the display indicates:



Confirm by pressing **ENTER** and the display indicates:



Use **NAV/PM1** to browse and **PM2** and **PM3** to select the letters, create the name (16 characters maximum). All the preset parameters will be saved, including input and output Mute. To confirm press **ENTER**. The display indicates:



NOTE: At any time you can cancel the procedure by pressing **ESC**.

2- PRESETS RECALL:

Press **UTILITY** and use **NAV/PM1** to display:

Press **ENTER** and use **NAV/PM1** to display:

Press **ENTER** and browse the preset list with **PM2** and **PM3**

NOTE: If there is no preset already saved, the display indicates «No Stored XOvers »

Confirm the preset choice by pressing **ENTER**, the display indicates:

NOTE: At any time you can cancel the procedure by pressing **ESC**.

3- PRESETS DELETE:

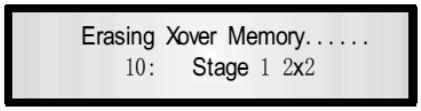
Press **ENTER** and use **NAV/PM1** to display:

Press **ENTER** and use **NAV/PM1** to display:

Press **ENTER** and browse the preset list with **PM2** and **PM3**.

Confirm by pressing **ENTER**, the display indicates:

Confirm the preset choice by pressing **ENTER**, the display indicates:



NOTE: Delete a Preset is irreversible.

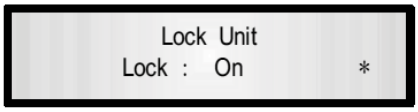
D- LOCK

1- SIMPLE LOCK

Press **UTILITY** and use **NAV/PM1** to display:

Press **ENTER** and use **NAV/PM1** pour to display:

Press **ENTER**, then press **PM2**, select « On » to lock, or « Off » to unlock the device. The current status is indicated by the asterisk in the right corner of the screen. Confirm with **ENTER**.



NOTES:

a. When the device is locked, none of the parameters can be modified.
If this procedure is known by the user, the parameters can be easily changed. In case of fixed installation or for renting business the procedure could be not applicable: in this case see the procedure described in paragraph **D2**.

b. It is possible to have all the parameters invisible: see chapter **D3**.

2- LOCK WITH PASSWORD

This procedure has 3 steps:

a. Create a password
b. Confirm the password
c. Lock the device

a. CRERATE A PASSWORD

Press **UTILITY** and use **NAV/PM1** to display:

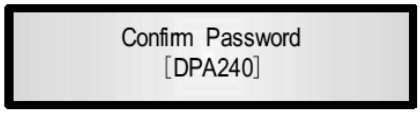
Press **ENTER** and use **NAV/PM1** to display:

Press **ENTER** to display:

The factory password is « 000000 ».
Select the data with **PM2** and **PM3** and browse with **NAV/PM1**.

Press **ENTER** to display:

Select the data with **PM2** and **PM3** and browse with **NAV/PM1**. The password cannot exceed more than 6 characters. Press **ENTER** to display (example with «DPA240»):



Press **ENTER** to display:

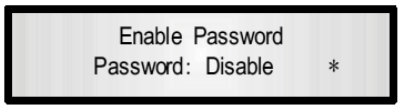
NOTE: **To unlock the devise the password is necessary. It is recommended not to forget it, and to memorize it somewhere. In case this password is lost, it is necessary to make a total reset of the device. In this case all settings and parameters will be lost forever.**

b. CONFIRM THE PASSWORD

Press **UTILITY** and use **NAV/PM1** to display:

Press **ENTER** and use **NAV/PM1** to display:

Press **ENTER** to display:



Press **PM2**, and select « Enable ». This option works only if the password is known.

c. UNLOCK THE DEVICE

Follow the instructions as described on **Simple Lock**.
It is possible to make all parameters invisibles: see paragraph **3**.

At this stage the device is fully locked: none of the button is active, except **UTILITY**, which enables the password input.
In case the password is forgotten or lost, only a full reset of the device is possible. The reset is the factory status when purchasing the device for the first time: all parameters and presets are lost forever.

3- DISPLAY UNLOCK

Whatever the choices, the parameters can be invisible.

Press **UTILITY** and use **NAV/PM1** to display:

Press **ENTER** and use **NAV/PM1** to display:

Press **ENTER**, then with **PM2**, select « Parameter will not be shown » for display locking, « Parameter will be shown » for display unlocking. The current status is indicated with an asterisk on the right corner of the screen. Press **ENTER**.

II- APPENDIX

1- DIGITAL INPUT SELECTION

The DPS 24 has a SP-DIF (RCA) digital input but it cannot operate with analog and digital inputs simultaneously. The input format needs to be specified before any operation.

Selection of the digital input:

- Press **UTILITY** and use **NAV/PM1** to display «System Utilities»
- Press **ENTER** and use **NAV/PM1** to display «Input Routing». The current status is indicated with an asterisk on the right corner of the screen.
- Press **ENTER** and use **PM2** or **PM3** to select «Digital».
- Press **ENTER**

2- POWER-ON STATUS

When the main power in switched on, the option "**Fade-In: On**" set the output level gradually up to the previous value of the last switch off. If the option "**Fader-In: Off**" is selected, the output level is set to its nominal value instantaneously.

Selection of the Power-On status:

- Press **UTILITY** and use **NAV/PM1** to display «System Utilities»
- Press **ENTER** and use **NAV/PM1** to display «Power-On Procedure»
- Press **ENTER** and use **PM2** or **PM3** to select «Fade-In: On» or «Fade-In : Off». The current status is indicated with an asterisk on the right corner of the screen.
- Press **ENTER**

3- UNIT FOR THE DELAY

The delay adjustment can be specified in Distance (meters) or in Time (milliseconds)

Selection of the unit:

- Press **UTILITY** and use **NAV/PM1** to display «System Utilities»
- Press **ENTER** and use **NAV/PM1** to display «Delay Units»
- Press **ENTER** and use **PM2** or **PM3** to select «Distance (m) » o «Time (ms) ». The current status is indicated with an asterisk on the right corner of the screen.
- Press **ENTER**

4- REAL TIME MODIFICATIONS

When parameters are modified some artifacts may occur. The DSP24 can attenuate the level during the parameters modification.

Selection of an automatic attenuation:

- Press **UTILITY** and use **NAV/PM1** to display «System Utilities»
- Press **ENTER** and use **NAV/PM1** to display «Ramps on Change»
- Press **ENTER** and use **PM2** or **PM3** to select «Ramps: On» for an automatic attenuation, or « Ramps: Off». The current status is indicated with an asterisk on the right corner of the screen.
- Press **ENTER**

5- FIRMWARE VERSION

To know the Firmware version of the device:

- Press **UTILITY** and use **NAV/PM1** to display «System Utilities»
- Press **ENTER** and use **NAV/PM1** to display «Software Version».
- Press **ENTER**: the firmware version is displayed.
- Press **ESC** to escape this function display.

6- USER INTERFACE SELECTION

The DSP 24 can be programmed by a computer. There is an USB port (cable supplied) and a RS485 port (XLR). The USB port enables the connection between one PC computer and one single DSP24.
The RS485 enables the communication between one PC computer and a network including several DSP24.

Selection of the interface:

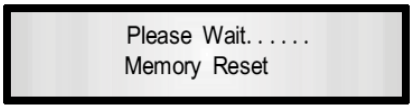
- Press **UTILITY** and use **NAV/PM1** to display «System Utilities»
- Press **ENTER** and use **NAV/PM1** to display «Interface Setup»
- Press **ENTER** and use **PM2** or **PM3** to select «Source: USB» or «Source: RS485. The current status is indicated with an asterisk on the right corner of the screen.
- Press **ENTER**

7- RESET PROCEDURE

If the DSP 24 has been locked with a password and the password is lost or forgotten the device cannot be unlocked with the programmed parameters anymore.
The device needs to be reset to the factory parameters status. In this case all parameters and presets will be definitively deleted and lost.

Reset of the device:

- Switch off the DSP 24.
- Press **ENTER**, **ESC** and **UTILITY** simultaneously by switching the power on.
- The display indicates :

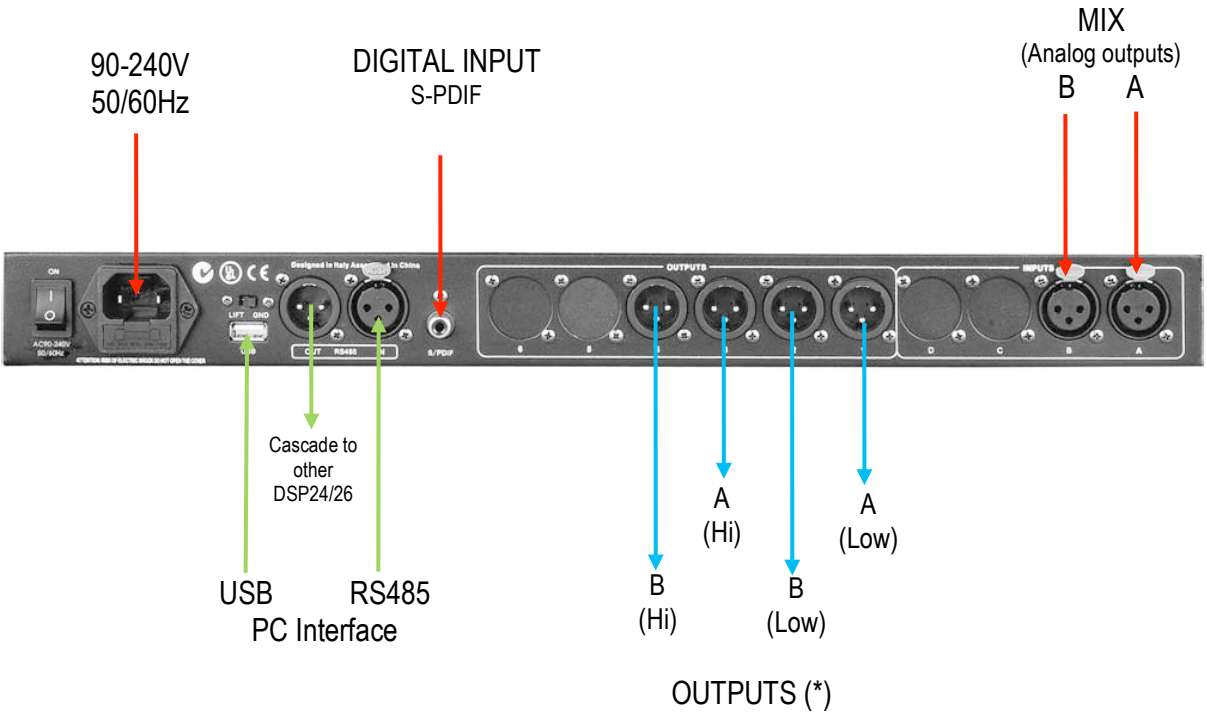


- Release the button and wait for the end of the procedure.

III- TECHNICAL SPECIFICATIONS

Analog inputs:	channel A, B, balanced XLR
Maximum input level:	+20 dBu
Analog outputs:	channel 1-4, balanced XLR
Maximum output level:	+20 dBu
DSP:	SAM3716, 24 bits
A/D converters:	AKM5392, 24 bits
D/A converters:	AKM4396, 24 bits
Sampling frequency:	48k Hz
Stereo digital input S-PDIF:	compatible with 32 kHz, 44.1 kHz and 48 kHz sampling rate
S/N ratio:	110 dBA
THD + N:	0.005%
Frequency response (bypass):	20 Hz-20 kHz (+/-1dB)
Power supply:	Switching
Interface:	USB - RS485

IV- BACK PANEL



(*): Routing can be modified

V- WARRANTY

This appliance is warranted parts and labor against any manufacturing defects for a period of two years from the date of purchase by the first user.

Conditions

1. The unit has been installed and implemented by observing the safety instructions in this operating manual.
2. The device was not diverted from its destination, either voluntary or accidental, and suffered no deterioration or modification other than those described here or explicitly authorized by AUDIOPOLE.
3. All modifications or repairs have been carried out by an authorized service station.
4. The defective product must be returned with the dealer who made the sale or to an authorized service station with proof of purchase.
5. The device was properly packaged to avoid damage in transport.

AUDIOPOLE

22, rue Édouard Buffard, Z.A.C. de la Charbonnière, Montévrain - 77771 Marne-la-Vallée Cedex 4 - France
Tél : + 33 (0)1 60 54 32 00 - Fax : + 33 (0) 1 60 54 31 90 - www.audiopole-pa.com - www.audiopole.fr